

REMARKS

The Applicants do not believe that entry of the foregoing response will result in the introduction of new matter into the present application for invention. Therefore, the Applicants, respectfully, requests that the above response be, kindly, reconsidered.

The Final Office Action dated May 19, 2005 has been received and considered by the Applicants. Claims 1-20 are pending in the present application for invention. Claims 1-6, 8-14 and 16-20 stand rejected by the May 19, 2005 Final Office Action. Claims 7 and 15 are objected to as being dependent upon a rejected base claim but otherwise stated as being allowable.

The Final Office Action rejects Claims 1-6, 10-14 and 18-20 under the provisions of 35 U.S.C. §103(a), as being obvious over Chapman (IEEE Transaction on Magnetics, V. 25, No. 5, pp. 3686-3688, 1989) (hereinafter referred to as Chapman). The Examiner's position is that a person of ordinary skill within the art would find it obvious to create the invention defined by the rejected claims from the teachings of Chapman. The Applicants, respectfully, disagree. There is no magnetic coil formed on a top layer as defined by the rejected claims by Chapman. The coil referred to by the Examiner is disclosed within Chapman as illustrated in Figure 7 and is not formed on a top layer of a substrate. Furthermore, there is no disclosure or suggestion within Chapman that would motivate a person of ordinary skill within the art any advantage could be gained from forming a magnetic coil on a top layer as defined by the rejected claims. Therefore, the Applicants respectfully submit that the claims are allowable over Chapman.

Claim 1 defines subject matter for a method of manufacturing a magnetic head having a magnetic coil formed on a top layer at a first side of a substrate, whereafter material of the substrate is removed from a second side of the substrate to expose at least a portion of the top layer, which second side is turned away from the first side, to form the head face. The Examiner alleges that Chapman teaches the foregoing subject matter. The Applicants disagree with the Examiner's interpretation of the teachings of Chapman as they are being applied to the foregoing subject matter defined by rejected Claim 1. Rejected Claim 1 specifically defines subject matter for the magnetic coil to be formed on a top layer of a substrate and removing material of the substrate from a second side of the substrate to expose at least a portion of the top layer. Chapman teaches forming an ABL layer on the substrate. Chapman further teaches forming the head elements on the substrate. The Applicants, respectfully, point out that the head elements of

Chapman are formed within various layers none of which could be considered the top layer as defined by rejected Claim 1. The closest thing to the top layer as defined by rejected Claim 1 within Chapman is the Air Bear Layer (ABL). There is no disclosure or suggestion for forming a coil on the ABL by Chapman. In contradistinction to the teachings of Chapman, rejected Claim 1 defines subject matter for forming a coil on a top layer of the substrate. Chapman specifically teaches that the first permalloy film of head elements is separated from the air bearing surface (ABS) by the ABL (see Process Approach lines 2-4). Chapman specifically teaches that the ABL and the head elements are deposited on a substrate wafer. There is no disclosure or suggestion to deposit the head elements on the ABL, specifically, to deposit the coil on the ABL. Moreover, Chapman specifically teaches that there are various layers used to form the head elements.

As shown in Figure 7 of Chapman, the coil that the Examiner refers is formed within an insulator layer adjacent another insulator layer formed on a leveling layer. The leveling layer is formed on the P1 layer of NiFe. The P1 layer is formed upon a P1 seed layer. The P1 seed layer is formed on the ABL. The Applicants, respectfully, request that the Examiner indicate which of the foregoing layers the Examiner is considering as being equivalent to or suggestive of the top layer as defined by rejected Claim 1. The top layer as defined by rejected Claim 1 is formed at a first side of a first substrate. The magnetic coil is formed on the top layer. The only layer that is formed at the side of the substrate in Chapman is the ABL. Once material is removed within Chapman, the ABL is the only layer that is exposed. There is no coil formed on the ABL disclosed or suggested by Chapman. Therefore, this rejection is, respectfully, traversed.

Claim 2 defines subject matter for wherein the substrate is silicon and the top layer is an insulating material with the top layer being adjacent to the first side. The Applicants respectfully point out that Examiner's comments regarding rejected Claims 2 are taken out of context. All the words in a claim must be considered. As previously discussed, only the ABL within Chapman is formed adjacent the first side. The ABL as taught by Chapman is a hard non-magnetic material. There is no disclosure or suggestion for the ABL of Chapman to be formed from an insulating material. The coil that the Examiner draws attention to in Figure 7 of Chapman is adjacent an insulator. However, there is no disclosure or suggestion within Chapman that the coil is formed on the insulator. Chapman is silent as to how the coil is formed.

Moreover, the coil that the Examiner refers to appears to be formed within an insulator layer that is another insulator layer formed on a leveling layer. The leveling layer is formed on the P1 layer of NiFe. The P1 layer is formed upon a P1 seed layer. The P1 seed layer is formed on the ABL. There is no disclosure or suggestion for the coil in Figure 7 of Chapman to be formed adjacent the first side. Therefore, this rejection is respectfully traversed.

Claim 3 defines subject matter wherein after a step involving the forming of a layer of a metal on the first substrate, at least one further step involving the forming of a layer of a non-conducting material and the forming of a further layer of a metal and the forming of interconnections between two neighboring layers of metal is performed to create the magnetic coil. The Examiner asserts that Chapman shows steps of forming metallic and non-metallic layers to create a magnetic coil. As previously discussed, there is no disclosure, suggestion or mentioning in any way manner or form that relates to the formation of the coil within Chapman. The Examiner is simply pointing to a coil formed somewhere within a substrate and making bold assertions without any basis in fact. As an example, the Examiner points to a plate via hole that is not disclosed by Chapman as being associated with a coil and asserts that this plate via is in some way used to create a magnetic coil. A plated via hole has no function in forming a magnet. Accordingly, this rejection is, respectfully, traversed.

Claim 4 depends from and further narrows and defines Claim 1. Therefore, since Claim 1 is believed to be allowable, claim 4 is also believed to be allowable.

Claim 5 defines subject matter for a method of manufacturing a slider having an air bearing surface and including a planar magnetic coil formed on a top layer at a first side of a substrate, wherein material of the substrate is removed from a second side of the substrate until the top layer is at least partially exposed. The Examiner alleges that Chapman teaches the foregoing subject matter. The Applicants disagree with the Examiner's interpretation of the teachings of Chapman as they are being applied to the foregoing subject matter defined by rejected Claim 5. Rejected Claim 5 specifically defines subject matter for the magnetic coil to be formed on a top layer of a substrate and removing material of the substrate from a second side of the substrate to expose at least a portion of the top layer. Chapman teaches forming an ABL layer on the substrate. Chapman further teaches forming the head elements on the substrate. The Applicants, respectfully, point out that the head elements of Chapman are formed within various layers none of which could be considered the top layer as defined by rejected Claim 5. The

closest thing to the top layer as defined by rejected Claim 5 within Chapman is the Air Bear Layer (ABL). There is no disclosure or suggestion for forming a coil on the ABL by Chapman. In contradistinction to the teachings of Chapman, rejected Claim 5 defines subject matter for forming a coil on a top layer of the substrate. Chapman specifically teaches that the first permalloy film of head elements is separated from the air bearing surface (ABS) by the ABL (see Process Approach lines 2-4). Chapman specifically teaches that the ABL and the head elements are deposited on a substrate wafer. There is no disclosure or suggestion to deposit the head elements on the ABL, specifically, to deposit the coil on the ABL. Moreover, Chapman specifically teaches that there are various layers used to form the head elements.

As shown in Figure 7 of Chapman, the coil that the Examiner refers is formed within an insulator layer adjacent another insulator layer formed on a leveling layer. The leveling layer is formed on the P1 layer of NiFe. The P1 layer is formed upon a P1 seed layer. The P1 seed layer is formed on the ABL. The Applicants, respectfully, request that the Examiner indicate which of the foregoing layers the Examiner is considering as being equivalent to or suggestive of the top layer as defined by rejected Claim 5. The top layer as defined by rejected Claim 5 is formed at a first side of a first substrate. The magnetic coil is formed on the top layer. The only layer that is formed at the side of the substrate in Chapman is the ABL. Once material is removed within Chapman, the ABL is the only layer that is exposed. There is no coil formed on the ABL disclosed or suggested by Chapman. Therefore, this rejection is, respectfully, traversed.

Claim 6 defines subject matter for method as claimed in Claim 5, wherein on a silicon substrate the top layer of an insulation material is provided in order to form the first substrate, the top layer being adjacent to the first side, wherein a substrate of glass is used as the second substrate, and wherein the silicon substrate is removed after adhering of the first substrate to the second substrate. The Applicants respectfully point out that Examiner's comments regarding rejected Claim 6 are taken out of context. All the words in a claim must be considered. As previously discussed, only the ABL within Chapman is formed adjacent the first side. The ABL as taught by Chapman is a hard non-magnetic material. There is no disclosure or suggestion for the ABL of Chapman to be formed from an insulating material. The coil that the Examiner draws attention to in Figure 7 of Chapman is adjacent an insulator. However, there is no disclosure or suggestion within Chapman that the coil is formed on the insulator. Chapman is

silent as to how the coil is formed. Moreover, the coil that the Examiner refers to appears to be formed within an insulator layer that is adjacent another insulator layer formed on a leveling layer. The leveling layer is formed on the P1 layer of NiFe. The P1 layer is formed upon a P1 seed layer. The P1 seed layer is formed on the ABL. There is no disclosure or suggestion for the coil in Figure 7 of Chapman to be formed adjacent the first side. Therefore, this rejection is respectfully traversed.

Claim 10 defines a slider manufactured by the method as claimed in Claim 5. Claim 5 as previously discussed is believed to be allowable, therefore, Claim 10 is also believed to be allowable.

Claim 11 defines a slider as claimed in Claim 10, wherein the top layer forms a protective layer for the slider. The Examiner states that the ABL is the top layer. The Applicants respectfully submit that there is no coil formed on the ABL within Chapman, as previously discussed. Therefore, this rejection is traversed.

Claim 12 defines a system for magnetically or magneto-optically recording information into a storage medium, the system including the slider as claimed in Claim 10. Claim 10 as previously discussed is believed to be allowable, therefore, Claim 12 is also believed to be allowable.

Claim 13 defines subject matter for a method of manufacturing a slider including forming the slider and the magnetic coil on a top layer at a first side of a first substrate, adhering the first side of the first substrate to a side of a second substrate, removing material from a second side of the first substrate, wherein the second side is turned away from the first side, until features of at least a portion of the top layer is exposed thereby forming a face.

The Examiner alleges that Chapman teaches the foregoing subject matter. The Applicants disagree with the Examiner's interpretation of the teachings of Chapman as they are being applied to the foregoing subject matter defined by rejected Claim 13. Rejected Claim 13 specifically defines subject matter for the magnetic coil to be formed on a top layer of a substrate and removing material of the substrate from a second side of the substrate to expose at least a portion of the top layer. Chapman teaches forming an ABL layer on the substrate. Chapman further teaches forming the head elements on the substrate. The Applicants, respectfully, point out that the head elements of Chapman are formed within various layers none of which could be considered the top layer as defined by rejected Claim 13. The closest thing to the top layer as

defined by rejected Claim 13 within Chapman is the Air Bear Layer (ABL). There is no disclosure or suggestion for forming a coil on the ABL by Chapman. In contradistinction to the teachings of Chapman, rejected Claim 13 defines subject matter for forming a coil on a top layer of the substrate. Chapman specifically teaches that the first permalloy film of head elements is separated from the air bearing surface (ABS) by the ABL (see Process Approach lines 2-4). Chapman specifically teaches that the ABL and the head elements are deposited on a substrate wafer. There is no disclosure or suggestion to deposit the head elements on the ABL, specifically, to deposit the coil on the ABL. Moreover, Chapman specifically teaches that there are various layers used to form the head elements.

As shown in Figure 7 of Chapman, the coil that the Examiner refers is formed within an insulator layer adjacent another insulator layer formed on a leveling layer. The leveling layer is formed on the P1 layer of NiFe. The P1 layer is formed upon a P1 seed layer. The P1 seed layer is formed on the ABL. The Applicants, respectfully, request that the Examiner indicate which of the foregoing layers the Examiner is considering as being equivalent to or suggestive of the top layer as defined by rejected Claim 13. The top layer as defined by rejected Claim 5 is formed at a first side of a first substrate. The magnetic coil is formed on the top layer. The only layer that is formed at the side of the substrate in Chapman is the ABL. Once material is removed within Chapman, the ABL is the only layer that is exposed. There is no coil formed on the ABL disclosed or suggested by Chapman. Therefore, this rejection is, respectfully, traversed.

Claim 14 defines the method of Claim 13, wherein forming includes forming on a silicon substrate the top layer of an insulation material is provided in order to form the first substrate, the top layer being adjacent to the first side, wherein a substrate of glass is used as the second substrate, and wherein the silicon substrate is removed by the step of removing after adhering of the first substrate to the second substrate. The Applicants respectfully point out that Examiner's comments regarding rejected Claim 14 are taken out of context. All the words in a claim must be considered. As previously discussed, only the ABL within Chapman is formed adjacent the first side. The ABL as taught by Chapman is a hard non-magnetic material. There is no disclosure or suggestion for the ABL of Chapman to be formed from an insulating material. The coil that the Examiner draws attention to in Figure 7 of Chapman is adjacent an insulator. However, there is no disclosure or suggestion within Chapman that the coil is formed on the

insulator. Chapman is silent as to how the coil is formed. Moreover, the coil that the Examiner refers to appears to be formed within an insulator layer that is adjacent another insulator layer formed on a leveling layer. The leveling layer is formed on the P1 layer of NiFe. The P1 layer is formed upon a P1 seed layer. The P1 seed layer is formed on the ABL. There is no disclosure or suggestion for the coil in Figure 7 of Chapman to be formed adjacent the first side. Therefore, this rejection is respectfully traversed.

Claim 18 defines a slider manufactured by the method of Claim 14. Claim 14 as previously discussed is believed to be allowable; therefore, Claim 18 is also believed to be allowable.

Claim 19 defines a slider as claimed in Claim 18, wherein the top layer forms a protective layer for the slider. The Examiner states that the ABL is the top layer. The Applicants respectfully submit that there is no coil formed on the ABL within Chapman, as previously discussed. Therefore, this rejection is traversed.

Claim 20 defines a system for magnetically or magneto-optically recording information into a storage medium including the slider as claimed in Claim 19. Claim 19 as previously discussed is believed to be allowable; therefore, Claim 20 is also believed to be allowable.

The Final Office Action rejects Claims 8 and 16 under the provisions of 35 U.S.C. §103(a) as being unpatentable over Chapman in view of U.S. Patent No. 6,452,742 issued to Crue et al. (hereinafter referred to as Crue et al.). The Examiner states that Crue et al. teaches a magnetic head and discloses an alumina layer is a heat sink layer. The Applicants would like to, respectfully point out that Claims 8 and 16 define subject matter forming a heat sink layer while forming the magnetic coil. Crue et al. provides no disclosure or suggestion for a magnetic coil that is formed on a layer on top of at a first side of a first substrate and removing material from a second side of the first substrate to expose the top layer upon which the magnetic coil is formed, wherein the second side forms the head face. The magnetic coil is formed on a layer at the surface of the first substrate; which layer becomes exposed. Crue et al. clearly illustrate that coil 140 as disclosed therein is not at the surface. Neither Chapman nor Crue et al. disclose the formation of a coil on a layer that becomes exposed as recited by rejected Claims 8 or 16. Accordingly, this rejection is respectfully traversed.

The Final Office Action rejects Claims 9 and 17 under the provisions of 35 U.S.C.

§103(a) as being unpatentable over Chapman in view of U.S. Patent No. 5,978,319 issued to Wang et al. (hereinafter referred to as Wang et al.). The Examiner states that Chapman describes the claimed method but does not show the structure of the coil and that Wang et al. discloses the structure of the coil. The Applicants, respectfully, disagree with this assertion contained in the Final Office Action. The teachings of Wang et al. relate to a coil assembly 12 that is mounted onto a slider 14. Rejected Claims 9 and 17 include all the subject matter of the claims from which they depend that have been previously discussed as being allowable. The recited magnetic coil, as previously stated, is formed on a layer at the surface of the first substrate; which layer becomes exposed. The present invention as recited by rejected Claims 9 and 17 recite a slider that is formed with a coil. The Applicants would like to, respectfully point out that Wang et al. is illustrative of the prior art problem that is solved by the present invention (e.g. see page 2, lines 21-25 of the specification to the present invention, wherein the problems associated with forming a "ditch" to place the coil in are discussed). The recited magnetic coil, as previously stated, is formed at the surface of the first substrate. Wang et al. clearly describes the independent formation of a coil to be placed on the slider afterwards and does not pertain to the formation of a slider with the coil formed on the slider. Neither Chapman nor Wang et al. disclose the formation of a coil at the air bearing surface as recited by rejected Claims 9 and 17. Accordingly, this rejection is respectfully, traversed.

Applicant is not aware of any additional patents, publications, or other information not previously submitted to the Patent and Trademark Office which would be required under 37 C.F.R. 1.99.

In view of the foregoing amendment and remarks, the Applicant believes that the present application is in condition for allowance, with such allowance being, respectfully, requested.

Respectfully submitted,

By 

James D. Leimbach
Patent Attorney Reg. No. 34,374

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By:


James D. Leimbach